

		Suc	Col	Ch		X1177	
186	Bodenkoff	++	-	-	-	2	1?
187		-	+	-	-	lac	0
188		±	-	-	-	0	0
189	2/23	-	-	-	-	2	2
190	mouse	#	-	-	-	lac	0
191	f.	-	#	-	-		
192		±	-	-	-		
193		±	±	-	-		
194	" s "	±	-	-	-		
<i>Repeats with controls</i>							
141	sl					1 Lact +	1?
144	sl					1, 5, 6	
148	sl					3 +, 2?	
152						0	
153	sl					0 0	
155						0 0	
162						1 +	
165	sl					0 1?	
170						0 0	
175						1 Lact	1?
176						1, 0	
177	sl					0, 1	
178						0 0	
<i>4. Chi</i>							
195	449231	Scalpfol.	Lac -			0 0	
196	345751	eye	Lac -			*	
197	479829	F	Lac -			0 0	
198	517533	U	U	Very rough!		1 +	
199	Betton	F	U				
200	519143	U	U	V. gummy			
201	372732	F	U	V. gummy			
202	61630			SR !			
203	519432					1 Malt	
204	278696	Thr				0	
205	405568	F		{ Lac -		1 M +	
206	520165	U		lactic?		0	
207	321610	F				0 0	
208	Kunelkova	Thr				0 0	
209	52063	F				0 0 0	
210	274372					1 +	
211	519697	Vag				1 +	
212	520116					1 +	
213	196082	U		Lac -		0 0	

175 } very unlikely as
177 } crossable

176 ??

Slant

U.C.L. 2/26/51

	EA Street	2/26
261	CS H 140	
262	W 402	
263	CB 6	
264	W 61	
265	W 85	
266	W 1	
267	CB 9	
268	MB 22	
269	DI 44	
270	CB 8	
271	WW	-
272		-
273		-
274		-
275		-
276	Kauffmann	
277		
278		3
279		4
280		5
281		6
282		7
283		8
284		9
285		10
286		11
287		12
288		13
289		14
290		15
291		16
292		17
293		18
294		19
295		20
296		21
297		22
298		23
299		24
300		25

hac

all the time.

Sn Yg
dissolve

X|WII7

EMSM-05M
3F1ST 8/52
7 X 1817

00 00 00 1 E 2 C J 00 00 00 00 00 0 T 0 0 0 0 Tu 0 can 6000 0 Fam 13 0 0 0 0 0

1 Mal⁺
 1 Mal⁻ ✓ (parent Mal⁺) proto.
 0
 2 Mal⁺: Parent is Mal⁻ ~~and~~ ^{one} Mal⁺
 ca 50 Lect Mal⁺ (269 par.)
 1. Ht

~~Proprietary~~

pink background

O Turbids.
X Turbid

0.00

Quinn
" " -
O 100 -

100
100

0
Few minutes
1 M+

3 Mal = ?

四
〇〇〇

O
K x 181

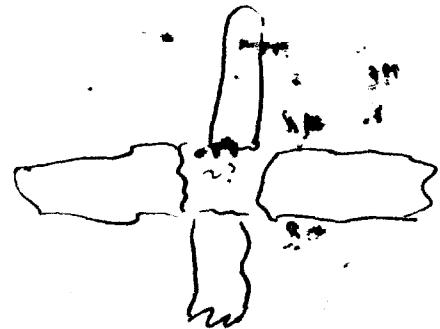
1817 ca 100 mostly -
x 2058 ca 400 mostly -

with 518 recent mutants!
check out on EMBac for
rest of R.

Note high proportion of colicin producers in Hauffmann's series

Escherichia coli *intestines*, and verify
numbering of all of Stuart cultures found
Saccharomyces Replics from original vial (C.A.S.)
and cross-streak.

Each was Saccharomyces as reported, but none
showed reciprocal inhibition as first
noted for "776-260." This was probably
an artifact (poisoned yeast?)



The numbering is re-assumed!

	Cultures	rec'd from	Brenham	3/3/51. Incubated to 1 ml Penassay.	x WII 77 EMS Mal am
301	P 474632	F	Lac	58 Ch - - -	
2	LUP 100345	F	+ +	+ - m?	
3	P 517488	F	parac	++ + +	
4	84467	F		++ ++ ++	Ca 50+, (-?) parent avised? Lac, Lac -
5	501064	F		++ ++ ++	
6	520817 P	F		++ ++ ++	
7	490633	U		++ ++ ++	Moldy plate; turb
8	517488	F		++ ++ ++	Ca 100+
9	520165	U		++ ++ ++	
10	100366	U	PLANT	++ ++ ++	
11	P 520927	F		++ ++ ++	
12	500684	F		++ ++ ++	
13	P 249502	F		++ ++ ++	
14	520791	U		++ ++ ++	
15	519187	Y		++ ++ ++	
16	448851	Y		++ ++ ++	ca 10+
17	P 369483	F		++ ++ ++	Ca 50-100+
				(x Ray)	
318	1	MB	7002	2+	(strong satellite effect)
19	2	"	"	0	
20	3	"	"	6+	
21	4	"	"	2+	
22	5	{	"	8+?	
23	6		"	2+	1-?
24	7	MB	"	10+	survived? sm. col. probably not +
25	8	"	"	4+	
26	9	"	"	2+	2-?
27	10	"	"	0	
18	"	"	"	0	
29	12	"	"	0	
30	13	"	"	0	
31	14	"	"	2+	
32	15	"	"	10+	
33	16	"	"	2+	Malutea mutabile like
34	17	"	"	0	1-
35	18	"	"	0	
36	19	"	"	0	
37	20	MB	"	0	

CA Stuart claims that 776-266
ferments lactose, later reverses pH!

I could not confirm this on EMB

or in NB-lactose-BCP.
Rechecks: several isolates verified Δ^R .

✓ some Kaufmann strains EMB Mal, Lac
W 15..68, 70, 71, 72, 75 are verified pure +

72 "SRP" n.g. in one day. hold. n.g.

✓ isolates from EMS Mal are

	Mal	Mtl	Lac	Oal	
68	-	+			
70	-	+	+	+	{ segregating N/o ?
71	3-1+	+	+	+	
75	1-1-	--	-+	-+	all N?

9/7/51

	Recd. 3/7/51.	Miln Sue	X-Ray Sue	Chk	mouse	All Cb - Rham + X ²
338	21	21	21	-	0	
39	22	22	22	+	2+	
40	23	23	23	-	3+	
41	24	24	24	+	1+ 1- ?	small
42	25	25	25	-	1+	
43	26	26	26	+	3+	
44	27	27	27	?		
45	28	28	28	+		
46	29	29	29	+	4+	
47	30	30	30	+	4+	
48	31	31	31	+	0	
49	32	32	32	+	0	
50	33	33	33	+	4	+
51	34	34	34	+	2++	
52	35	35	35	+	4++	
53	36	36	36	+	0	
54	37	37	37	+	2+	
55	38	38	38	+	ca 100	+
56	39	39	39	+	5± 6-	
357	40			+		

	4W-PHL. Kuni cultures	3/8/51. all the Sue Chk	X-		
358	18399	Mal - Cb ±		0	Mal - mutable
59	20879			0	
60	-			0	
61	-			0	
62				0	
63				0	
64				3	large
65				0	
66	Lac ^{slb}	cb +		0	
67				0	
68				0	
69				0	
70	S ^a			lysogenic phase	
71			- +	0	
72	Lac + Mal - SR		+	0	
73			- +	lysogenic phase	Mal - stable
74			-	0	maybe duplicate of 370
75			-	0	
76	eucalyptus		++	1+g	

3/14/51.

Residual from EMS Malvern. To same. Repels single colonies to EMB
Loc + Mal.

		L	M
1	326	Mal - ?	+
2	"	"	+
3	"	Mal + ♀	++
4	"	"	++
5	318	- ?	+
6	"	+ sl.	+
7	341	+	+
8	"	+	+
9	216	+	+
10	287	- ?	+
11	346	+	+
12	215	±	$\frac{346^2 - 215^2}{2} = 549$
13	"	±	±
14	356	+	2×549
15	"	+	
16	"	+	
17	"	+	
18	"	+	
19	324	+	<u>Self-plaquing</u>
20	"	+	
21	"	+	
22	331	+	<u>249</u>
23	308	+	
24	"		
25	"		
26	"		
27	350	+	-
28	"	±	
29	"	±	
30	"	±	

	L	M	EHS Mal. ssn.
31	199	+	+
32	323	+	+
33	"	+	+
34	"	+	+
35	351	+	+
36	"	+-	?
37	170	+	+
38	333	+	+
39	215	+	+
40	"	+	?
41	345	+	+
42	"	+	+
43	355	+	+
44	"	+	+
45	"	+	+
46	"	+	+
47	234	- ?	also streaks out
48	"	±	
49	"	-	
50	"	+	
51	237	-	- ✓ non-pacified!
52	"	-	- also Ptl - Xyl -
53	"	-	-
54	"	-	-
55	322	+	+
56	"	+	+
57	"	+	+
58	"	+	+
59	352	+	gummy +
60	"	+	wormy +
	"	+	
	"	+	

	C	Mal	Lac	Xyl (var?)
" 1	-	-	-	-
" 2	-	-	+	-
" 3	-	-	-	-
" 4	-	-	+	-

Very likely recombining!

141 315 165 349 gave no growth on rethbering

Tech. Summary 3/14/51

	lac (original state)	lac present in Cb	See	Ch ⁵⁰	All X ^R	All - S.M.	R
377	+	+		-	-	-	
78	+	+		-	-	-	
79	+	+		-	-	-	
80	+	+		-	-	-	
81	+	+		-	-	-	
82	±	+		-	-	-	
83	+	+		-	-	-	
84	+	+		-	-	-	
85	+	+		-	-	-	
86	+	+		-	-	-	
87	+	+		-	-	-	
88	+	+		-	-	-	
89	+	+		-	-	-	
90	-	-		-	-	-	
91	-	-		-	-	-	
92	-	-		-	-	-	
93	-	-		-	-	-	
94	+	+		-	-	-	
95	+	+		-	-	-	
96	-	+		-	-	-	
97	+	+		-	-	-	
98	+	+		-	-	-	
99	+	+		-	-	-	
400	+	g		-	-	-	
401	+	g		-	-	-	
402	+	g		-	-	-	
403	+	+		-	-	-	
404	+	+		-	-	-	
405	+	+		-	-	-	
406	±	-		-	-	-	
407	±	-		-	-	-	
408	±	+		-	-	-	
409	-	+		-	-	-	
410	±	-		-	-	-	
411	-	-		-	-	-	
412	-	-		-	-	-	
413	+	-		-	-	-	

398: 8 streaked out

L. M.

++ ++ ++ +-+ ++ ++ --

403:

(+) - - - - - + + + + + +

Sucrose:

OO

See over

On cellophane plates,

11 spots were found on series 391-400

9 " " " " 401-410.

These had following characters:

Cl	Suc	Suc original series	Lac original series
-	-	-	-
-	-	-	+
-	-	-	-
-	-	-	+
-	-	-	+
-	-	-	+
-	+	+	+
400a	+	+g	
+	+g	+g	401 +
+	+g	+g	+
-	+	+g	+
-	=	-	+
+	+	+g	406 -
+	-	++	+
+	+	+g	+
-long.	p.g.	-p.g.	+

It is inferred that 406 was misplaced to 400a.

Check on EMB Lac; in presumed correct sequence.

Recd. 3/12/51 Uchi Bentham

??
sewage samples?

are only hard col.

776	5805
77	5711
78	5708
79	5711
79	6557
780	4982
781	5712
782	5710
783	5396
784	5713
785	5125
786	6382
787	6551
788	5805

Verifications and Repeat tests

287 C 0 x : 1+ Repeat!

162 X 0,0

215 X 1+, 1-? 6+ 1-?

266 C 0
X 0,1 Repeat!

144: Mis-test

153: "

279 C 0

285 C 2-? Repeat!

165 X ca 10+

284 C 0 !

280 C 0

148 X A

In addition to purification and classification of above, further crosses should be done on:

232.: smaller growing colonies prove to be Mal-mutable also! Repeat controls

Verifications & Repeats

776

Summary.

- ✓ 162 ✓ 1 prototroph E w1177I W1546
 ✓ 165: × several [par]
 ✓ 170 × 4 [par]
 ✓ 232 × several [par] = Mal-Lac-mutant! Others picked from
 EMB 17al streaks: X (= w1177)
 ✓ 268. × grew out poorly. Recovered [w1177].
 ✓ 275 × SD
 ✓ 175 × 1 SD 1 [par]
 ✓ 176 × 1 [par] but v.slow on EMB Mal
 ✓ 177 × 1 SD
 ✓ 266 ✓ 1 X+ [w1177]. Par. X-! W1547
 ✓ 269 × many X+ [par]
 ✓ 250 × " "
 ✓ 231 × ca 5 " "

Reverses

- Repeat*
- ✓ 250 × ca 60 Malt+. But 250C: also 60-100 Malt+
- ✓ 288C: ca. 100 Malt. (mutant!) (But 288X: 0)! Repeat!
- ✓ 31 ✓
 ✓ 141 ca SD +
 ✓ 170 1 +
- ✓ 269 × ca 60+ 3 morph. types But 269C also 60-100 Malt+ (Mal-also?)
- ✓ 274 × Trubid (+,-?) (After plating solid, (turbid plate streaked out and colonies tested
 72°C: turbid) 30: all Malt+ or --)
- ✓ 317 × C: 0 X: 0 Again 317X: 1 M+

776
Summary 3/19/51.

In series 377-413, Recheck group of 11 cultures to insure count recovery of "398" and "403". Cellbrose plate shows 11 spots in row 391-400 and 9 in 401-410 bespeaking a misplacement.
Also confirm S^R from 386

b) Repeat 287, 266, 285 Σ, X

Criteria in outcross tests.

- a) 10 or more X^+S^R in first test
 - i) Occurring consistently in repeated tests, not in controls
 - or
- b) Any X^+S^R in first test showing a non-parental combination.

Program 3/21/51. Separates others

W177 mouth

- 130 ✓ C, X ? : faint turbidity X : heavy turbidity
- 141 X 1?
- 144 X 1+, -??
- 153 X
- 165 X
- 176 X
- 215 X
- 232 separate +, - X $\frac{c}{+} 20 - m$ (Turb) A 1-
233 X 1+
- 268 separate X pure *
- 279 C, X C 1? X 2?
- 280 " CO X 2+
- 284 " 0 0
- 287 " X 1+ C: 3+4"-
- 292 X ca 20+
- 299 X 0
- 304 (sep. +, -) X $\frac{304+33+}{304-Turbid!} \frac{P}{X} \frac{C}{Y} \frac{4-5}{5}$ 355 X 0
361 X 2-
- 308 X crowded + But 308 also
- 314 X 0
- 315 X -
- 333 X 0 $\frac{P}{X} \frac{C}{Y} 333+ 0$
- 402 X 0
- 405 X 0 405 $\frac{P}{X} \frac{1+}{Y} 406$ do.
- 408 X 0
- 318 X 2+
- 356 X- 0
- 324 X 0 $\frac{P}{X} \frac{C}{Y} \frac{0}{Z}$

3/21/51

130 ① Many small cols.

141 ② 50+

144 ① 18 Lac? ② 4 ++

153 (Lac-) ① Lac+? ② 0

162 ① Lac-Mal- . Strike or further tests

165 ① 60 ++ ② 0 ③ 10 ++

176 ① 1 Mal± (parent is++) ② 0, 1

215 ① 5 Mal- did not grow out ② +, - ? : ++ ③ 3+ 1-?

~~225~~ ① 50-100 Mal+, -? ② turbid

~~231~~ 5 M+L+ ② 0

232 16 M? (232 per: mixed) pure + mal- " lac- "

233 5 M+L+

~~234~~ 4: mix. +, - ② many " + -" ③ ~~turbid~~

~~237~~ 3-4: +, -

250 ① 100 M+L+ ② 60 ++ ③ 60-100 ++

✓
//

✓266: ① 1 [W1117 ML] ② 0,1 ③ 0

vv

268: ① 2 M+ [par. unstable -] did not grow out

✓269: ① 50 ++ ② 60++ ③ 60 ++

279 ① Turbid ② 0

280 " ② 0

284 " ② 0

285 " ③ 2 -?

287 ① 100-200 M+ ② 1++ ③ 0

288 100 M? ① 288C → S⁺.

292 minute colonies

294 3 M-?

304 ① 50 M+, - ② (par. bac-, +). ③ Turbid +

308 ① 100+ ② 100+ ③ ++

314 25+ ++

315 10+

317 ① 50-100+ ② 0 ③ 0 ④ 1

333 ① --

386 ① 500+ ② Turbid

398 ① 40+, -

402 ① 5++ muc.

403 + -

405 10++

408 8+

318 ① 2 M-?

vv

vv

356 ①
② + - ?

324 ①
+ - ?

327 ①
+ - ?

355 ① 100 ++

361 ① 6-7 m., slow, grew out poorly. → S^D! Not secant.

In same series as 377-413.

K12 + control

w1177

several hundred +, -

0, 0.

3/20/51

Growth necessary for K12 + w1177 on EMS sm? : (also of existing recombinable stocks)

K12

w1490

K12 x w1490
w1177

several hundred +, -
" " "

1	396	2+
2	397	0
3	398	10-20 + -
4	399	0
5	400	ca 30 +
6	406	0
7	401	0
8	402	0
9	403	10-20 + -
10	404	0
11	405	2+
	408	0
	409	0
	410	0
	411	0
	412	0

1	100	- +
2	3+	1- (tiny)
3	1-	
4	0	
5	Turbid	
6	ca 200	+, 100 sm + some - ?
7	0	
8	ca 100	+, 200 small + some - ?
9	0	
10	7	+

Method may be no more efficient than mixed culture except where colicin acts superactively, when it should certainly be used.

U. Chicago ^{LAC} *Braham*
Mal

414	401120	F	
415	LN 100410	F	P.A.NL
416	P-520370	F	+
417	P-520982	F	+
418	P-381020	F	HEM.
419	P-160818	F	+
420	446552	U	+
421	P-501021	F	+
422	521351	THROAT	+
423	P-544841	F	+
424	LN 100411	F	P.ANL
425	467324	U	+
426	441614-P	F	+
427	P-520347	F	+
428	521250	U	+
429	P-160818	F	+
430	458645	U	+
431	P-447925	F	+
432	P-22795	F	HEM.
		Benham - Turner	
433	T324	Ear	+
434	171	U	+
435	1505	F	-
(436)	253	U	+
437	1349	Wound	+
438	1678	Thru	+
439	330	Foot Lesion	-
(440)	1627	Bronchial	+
441	1528	Throat	+
442	1588	U	+
443	1428	F	-
444	1650	Tonsil	+
445	120	U	+
446	1595	Throat	+
447	393	U	+
448	1471	Bronch	-
449	237	Bronch	+
450	1684	F. Fistula	+
451	1498	U	+
452	1464	Vag.	+
453	—		—
454	su 439		

EMS Melsen
all λR

all λ^R
 1+
 0
 0
 + - ?] all \rightarrow lac-Mal-
 via E480
 0
 3+ (1 large + 2±)
 Turbid
 14+ (-?) \rightarrow ++ and --
 via E480
 Turbid
 0
 0
~~1+ 5+~~
 Turbid
 2+
 0
 0
 0
 0
~~+0+~~ 10+ ~~more~~ 10+ ~~more~~
~~10+ more~~
 Turbid
~~1+~~
 2+

U-Chi. - Bohnhoff March 29, 1951.

Lac CB Su Ch ~~Si~~

all Malt + λ^R Malt + Cl-
EMSMal x W1177

4W - PHL (unicultures)

486	+	+
487	+	+
488	+	+
489	+	+
490	+	+
491	+	+
492	+	+
493	+	+
494	+	+

2

$\begin{matrix} O \\ T \\ 4+ \\ \text{ca } 150+ \text{ some small -? background?} \\ 1+ \\ 6 \\ 4+ \\ O \end{matrix}$

425: *campbelli* 468, 469, 470.

457-58 are distinct

Check photography of
440, 436.

Reschedule 440.

776 f.

436. All finally processed photographs were Maltbaet like parent, but delayed.

440.

"

"

"

However, this should be repeated again.

U Chicago - Benham - Reed 4/2/51

WU 1177/502

		lac	Malsm	Sue	Cle	Ob
495	452149 F	+	+	-	++	-
496	427671 F	+	+	-	-	-
497	448304 F	+	+	±	±	-
498	489866 H	-	+	±	-	+
499	292625 F	+	+	-	±	-
500	484071 F	+	+	-	±	+
501	522064 F	-	+	+	-	+
502	64224 H	+	-	-	-	-
503	522611 F	+	+	+	-	-
504	299124 F	-	+	-	+	-
505	439495 A	-	+	-	-	-
506	463920 Sputum	-	+	±	-	+
507	511218 U	-	+	±	-	-
508	522268 F	-	+	-	±	-
509	522084 F	-	+	-	±	-
510	330139 F	-	+	-	±	-
511	GREENLER F	-	+	-	±	-
512	522035 F	-	+	±	+	-
513	445683 F	-	+	-	±	-
514	519625 F	-	+	-	±	-
515	185708 F	-	+	-	±	-
516	477561 F	-	+	-	+	-
517	451131 U	-	x	-	±	-
518	485841 U	+g	x	+g	-	+g
519	521422 U (BLADDER)	+g	x	+g	-	+g
520	1270 VAGINA	+g	x	+g	-	+g
521	474858 THROAT	+g -	-	±	-	+

R

502 522 325416 F
517 523 512128 U
498 524 ERLENBORN F

4/12/51

522 Monkey-enteritis uw + + S
523 NW PHL 24612 + + +
524 " 24613 + + +
525 " + + + +
526 " + + + +
527 " + + + +
528 " + + + +
529 " + + + +
530 "

0
3+
0
0
2T
1+

ca 150 -? (like 477)

1+
0
T
T
10+
0
0
0
0

ca 30 mucoid +

0
2+
ca 20 +
9+

ca 40 muc +

T
0

4 mucoid 2 nonmuc

5+
24+
ca 60+ 2- ! sl. background

475 } both gave Mal + Lac -
479 } and Mal - Lac +
Festile! recombinants.

502: Mostly did not grow out. Those which did were partial S^r.
Mal - Lac +. Check, if you., on Mtl.
all Xyl - Mtl + like 502.

Summary: April 7, 1951.

776

(234, 237, (P98, 403). Tentatively accepted as untrustable.

162, 266

Still to be repeated again:

old business

144, 292

361, 153

New prospects:

(+ - ??

436

++ only or ?

440

400.

472

430

477

431

~~478~~ ✓

490

502

513

518

521

	P	1+ 3+	PX	3truy-	2-
440	O	.	O		X
436	O	.	O		0 0 0
475	1+		18 +		0
477	5+ 1 ^{sum}		5+1-		1+
490	4+		O		0
495	O				
502	6-		3truy-		6-
479	5+		1		0

			Matt's	R
Berduan ~		berduan	berduan	berduan
531	P. 511218	F	++ -	-
532	P. 524148	F	- ++	-
533	522051	U	++ -	-
534	522939	U	- -	-
535	P. 324274	F	++ -	-
536	324931	U	- +	-
537	500680	U	- -	-
538	P. 501572	F	++ -	-
539	391539	F	++ -	-
540	52392	U	- +	-
541	294961	F	- +	-
542	523925	U	- +	-
543	349760	F	++ -	-
544	524034	U	- +	-
545	P. 501519	F	- -	-
546	P. 334483	F	- +	-
547	498458	U	- -	-
548	P. 5759	F	- -	-
549	523914	U	- -	-
				5+ ← 2-turb

4WPML 4/16/51

all Matt's λ^R MK + sort

550	microid	+	++ -	++	1 - ?
551	"	+	++ -	++	0
552	"	+	++ -	++	Turbid
553	"	+	++ -	++	0
554	"	+	++ -	++	0
555	"	+	++ -	++	0
556	"	+	++ -	++	0
557	"	+	++ -	++	0
558	"	+	++ -	++	0
559	"	+	++ -	++	0
560	"	+	++ -	++	0
561	"	+	++ -	++	0
562	"	+	++ -	++	0
563	"	+	++ -	++	0
564	"	+	++ -	++	0
565	"	+	++ -	++	0
566	"	+	++ -	++	Turbid

(+) = tested for P. Negative unless otherwise stated

	CP Miller (Chi)	5/1/51	Lac	Suc	Che	Sum	Nal	T	R	x EMS Madsen
567	81		+	++	-	+	-	-	0	0
568	82		+	++	-	+	-	-	0	0
569	83		+	++	-	+	-	-	0	0
570	84		+	++	-	+	-	-	0	+
571	85		+	++	-	+	-	-	0	0
572	86		+	++	-	+	-	-	0	+
573	87		+	++	-	+	-	-	0	0
574	88		+	++	-	+	-	-	0	+
575	89		+	++	-	+	-	-	0	0
576	90		+	++	-	+	-	-	0	0
577	91		+	++	-	+	-	-	0	0
578	92		+	++	-	+	-	-	0	0
579	93		+	++	-	+	-	-	0	0
580	94		+	++	-	+	-	-	0	0
581	95		+	++	-	+	-	-	0	0
582	96		+	++	-	+	-	-	0	0
583	97		+	++	-	+	-	-	0	2+
584	98		+	++	-	+	-	-	0	7+
585	99		+	++	-	+	-	-	0	0
586	100		+	++	-	+	-	-	0	0
587	101		+	++	-	+	-	-	0	0

Busham - U.Chi 5/7/51

wg17
 607 T-662 F
 608 T-452 F
 609 T-797 gall bladder
 610 T-1247 U

wg18
 611 P-523432 -
 612 P-320694 F
 613 T-1430 Lu Ng.
 614 T-1433 BRONCHIAL
 615 T-1006 U
 616 T-1163 U
 617 T-904 U
 618 T-664 SPUTUM
 619 P-517924 F
 620 T-938 WOUND

wg19
 621 T-852 U
 622 T-1716 U
 623 T-1506 U
 624 T-1281 SPUTUM
 625 T-919 LUNG
 626 T-1643 BRONCHIAL
 627 T-1623 R.Tibia
 628 T-629 EAR
 629 T-968 U
 630 T-1010 LUNG

wg20
 631 T-632 F
 632 T-1546 U
 633 T-357 BRONCHIAL
 634 T-514 U
 635 T-718 U
 636 T-1041 F
 637 T-1617 U
 638 T-669 U
 639 T-687 F

Loc S + Mal Cr Cl Suc

R - - + + -

O 1+ Ca 200 Mal - : 80% lact

2? X Repeat
ca 100+, 3 types (Lact +, Lact -)

T 1+ 2-? 4-?
O 0 0

O O O

3- 1-? 1-?
5+ → Lact +, -, Malt
O

O 3?

Ca 100 Mal + Lact
O 9+ 1?
T

	Uchi-Benham	Lac	Mal	MRE	S	Cb	Ch	Suc	EMS/Mal	Lac	transp
			+	+	+				surv.		
640	P-444050 F		+	+	+			++	25+	suitable for fem. vegetati-	
641	P-349760 F					++	-	++	0		
642	525527 u					-	++	++	0		
643	441814 u					-	-	-	30+	1+	
644	417961 u					-	++	+	T		
645	524438 u					-	-	+	T		
646	T-1435 u					-	-	+	T		
647	434910 u					-	-	+	T		
648	437362 F					-	+	-	O		
649	511243 u					-	-	-	O		
650	308312-P F					-	++	-	O		
651	P-308312 F PARACOLON					++	++	++	1+		
652	11591 u					-	-	-	0		
653	P-454517 F PARACOLON					-	++	+	0		
654	P-1559 F					-	-	-	50+	5-	
655	P-523392 F					-	-	++	2+		
656	P-469762 F					-	-	++	30-		
657	P-449672 F					-	++	-	40+		
658	P-523877 F					-	++	+	0		
659	P-52360 F					-	++	++	0		
660	P-445038 F					-	++	++	0		
		WG 21									
		WG 22									
661	P-393085 F					-	++	++	2+	1-?	
662	P-448812 F PARACOLON					+	++	++	0		
663	P-440707 F					+	-	-	0		
664	P-446437 F					+	-	+	0		
665	402951-P F					+	-	++	0		
666	523643 F					+	-	+			
667	P-493127 F					+	-	++			
668	P-448780 F PARACOLON					+	-	-			
669	P-523115 F "					-	++	-			
670	P-524772 F					+	+	-			

644 and 658 combined not fertile
but best in mycorrhizal

644
655
657
658

T. m. lessividic.

PHL - U.W. 5/8/51

Repeat: ~~671~~ 672 671 694